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SCHEME

OF

# TECHNICAL EDUCATION IN MYSORE

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1985

BANGALORE:
PRINTED AT THE GOVERNMENT PRESS
1912.

# TECHNICAL EDUCATION IN MYSORE.

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No. 581-635

OFFICE OF THE MYSORE ECONOMIC CONFERENCE,
'RINGWOOD,' BANGALORE,
*Dated 5th December 1911.*

FROM

C. KRISHNA RAU, ESQ., B.A.,
*Secretary, Education Committee.*

TO

SIR,

As a Member of the Committee appointed by the Government of Mysore for the elaboration of a scheme for the improvement of Industrial Schools in Mysore, I am desired to forward, for your perusal, a copy of the draft report prepared by the Committee and to request that you will be so good as to favour the Committee, by the 10th of January next, with any observations and suggestions that you may wish to make in regard to the proposed scheme.

I have the honor to be,
Sir,
Your most obedient servant,

C. KRISHNA RAU,
*Secretary, Education Committee, and*
*Member, Industrial Schools Committee.*

Karnataka State Archives
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No. BANGALORE, 10TH SEPTEMBER 1912.

FROM

THE COMMITTEE FOR INDUSTRIAL EDUCATION.
*(Appointed in Government Proceedings No. 3585-9—Edn. 462-09-2, dated the 28th October 1910.)*

To

THE SECRETARY TO THE GOVERNMENT OF MYSORE,
GENERAL AND REVENUE DEPARTMENTS,
BANGALORE.

SIR,

We have the honour to submit a detailed report comprising a scheme of Technical Education in Mysore as called for by Government in their Proceedings No. 3585-9, dated the 28th October 1911. In compliance with instructions received, a comprehensive programme with defined courses of training has also been indicated as far as it is possible to do so in a general scheme of this sort.

With a view to submit proposals for immediate action, the Chairman of this Committee addressed you recently asking for information as to the amount Government were prepared to spend on Technical Education in the current year as well as in the next two or three years. We notice from your reply No. 1657, dated 20th August 1912, that a grant of Rs. 50,000 capital and of Rs. 10,000 recurring has been sanctioned.

2. Before any practical programme can be drawn up, it is important that Government should be prepared to state what money they desire to spend for a definite term of years. In the absence of specific instructions on this point, we have thought it necessary to assume figures as under, which we consider reasonable for the next three and a half years:—

| | Capital | Recurring. |
|---|---|---|
| | Rs. | Rs. |
| 1912-13 ... | ... 30,000 | ... ... 30,000 |
| 1913-14 ... | ... 50,000 | ... ... 1,35,000 |
| 1914-15 ... | ... 50,000 | ... ... 1,55,000 |
| 1915-16 ... | ... 50,000 | ... ... 1,60,000 |

3. The draft report on the scheme of Technical Education was prepared in November 1911 and copies were submitted to Government and simultaneously circulated to members of the Economic Conference and other gentlemen interested in the subject with a request that they would favour the Committee with their criticisms and suggestions. These opinions have now been received.

The scheme was also placed before the Economic Conference during the last Birthday Session, but for want of time, it was not taken up for discussion.

We understand that the Education Committee of the Economic Conference have gone into the scheme and made certain recommendations.

Some selected opinions received have been printed as an enclosure to this letter.

4. The opinions given by the gentlemen consulted show that no serious objection has been taken in any quarter either to the scheme as a whole or any important section thereof, save in respect of the proposed College of Technology in Bangalore. After a careful consideration of the suggestions received, we have thought it desirable to suggest the postponement of the establishment of a college for the present, but we consider it necessary that a beginning should be made with at least a few classes which should form the nucleus of a future college. As suggested in the report, all necessary scientific training that is available in the Institute of Science and the Central College should be fully availed of by the students of these classes.

5. It would be possible to provide staff and conveniences, including a hired building, at an outlay of Rs. 25,000 per annum to commence with. We attach great importance to the training of leaders and managers of industries, which shall be the object of this class. Some selected students and apprentices to the number of about a dozen may be admitted to the class from 1913. The workshop in Bangalore will have to be enlarged. We understand that proposals, to this end, are under consideration in the Public Works Department.

6. The grant for the current year for developing the Chamarajendra Technical Institute in Mysore stands at Rs. 50,000 capital and Rs. 10,000 recurring. As it is understood that the building is not likely to be ready for some months to come, we propose to redistribute the grant as follows:—

| | Rs. |
|---|---|
| (1) Classes for the higher Industrial Education, (Equipment and Apparatus) ... ... ... ... | 12,500 |
| (2) Chamarajendra Technical Institute ... ... ... | 22,500 |
| (3) Subsidies and Grants-in-aid and Model and Demonstration Schools ... ... ... ... ... | 12,500 |
| (4) Direction and Control ... ... ... ... | 12,500 |
| Total ... | 60,000 |

Out of a total of Rs. 60,000 granted for this year, Rs. 22,500 may be given for capital and recurring outlay in connection with the Chamarajendra Technical Institute and the balance of Rs. 37,500 utilised for making a commencement with the working of a Technical Education programme as recommended above.

The workshop in Bangalore has to be developed and subsidies and grants-in-aid given, as local bodies or individuals come forward with sufficient funds to supplement Government grants. It is important that the foreign scholarships should receive early attention if we are to get trained men within the next few years for industrial and commercial work within the State.

7. The Committee therefore beg to recommend that the annual expenditure for the three years, commencing from 1913-14, inclusive, may be as shown below:—

| Items | 1913-14 | 1914-15 | 1915-16 |
|---|---|---|---|
| | Rs. | Rs. | Rs. |
| 1. Higher Industrial Education ... ... | 25,000 | 25,000 | 25,000 |
| 2. Chamarajendra Technical Institute ... ... | 25,000 | 25,000 | 25,000 |
| 3. Improving existing Industrial Schools ... ... | 10,000 | 25,000 | 25,000 |
| 4. Subsidies and Grants-in-aid and Model Institutions ... | 10,000 | 15,000 | 20,000 |
| 5. Scholarships and Foreign Training ... ... | 40,000 | 40,000 | 40,000 |
| 6. Direction and Control ... ... ... | 25,000 | 25,000 | 25,000 |
| Total ... | 1,35,000 | 1,55,000 | 1,60,000 |

The capital outlay in each of the three years may be taken at Rs. 50,000.

8. In connection with the general scheme we have recommended an initial capital outlay of Rs. 5 lakhs spread over three years and a recurring outlay of Rs. 3 lakhs. Our present proposal for a commencement is the modest one indicated in paragraph 6 above which involves a capital outlay of Rs. 35,000 in the current year, of Rs. 50,000 in each of the succeeding three years, besides a recurring outlay of Rs. 25,000 for the current year, and Rs. 1,35,000, 1,55,000 and 1,60,000, respectively, in the succeeding three years. Government have already sanctioned Rs. 60,000 for the current year and we now propose merely to redistribute the grant. No additional grant will, therefore, be needed till the 1st July next if these proposals are sanctioned.

9. As two months of the official year have already elapsed, we request that Government will be pleased to sanction the programme outlined in this letter at a very early date. The details may be worked up in consultation with the Education Department by the Special Adviser for Industries and Commerce to whom we recommend that the execution of the proposals may be entrusted. The Adviser may be required to work in consultation also with the Education Committee as well as with the Committee for Industries and Commerce of the Mysore Economic Conference.

10. We also beg to suggest that a small Committee be at once formed with Mr. Chatterton as Chairman and the Inspector-General of Education, Mr. Subbaswami Iyer and Mr. B. C. Srinivasiengar as members to report for the sanction of Government a detailed scheme of work and proposals for spending the grants recommended for the current and the coming year.

11. To sum up, we recommend that—

(1) The scheme of Technical Education in Mysore elaborated by the Committee be approved by Government as a basis for practical action for the next five years.

(2) The full scheme which involves a capital outlay of Rs. 5 lakhs and a recurring annual outlay of Rs. 3 lakhs be brought into operation as early as circumstances permit.

(3) That for the next 3½ years commencing from 1st January 1913, the programme of work and the expenditure suggested in this letter be sanctioned.

(4) A Committee, with the Special Adviser for Industries and Commerce as President, be appointed at once to formulate detailed proposals to give effect to the programme and utilise the funds, allotted in the current year and to be allotted for the year 1913-14, in consonance with the principles indicated in this letter and the accompanying report.

We have the honor to be,
Sir,
Your most obedient servants,

M. VISVESVARAYA.
V. RANGASWAMI IYENGAR.
C. KRISHNA RAU.
G. SUBBASWAMI AIYAR.

*Copy of letter dated 5th January 1912, from C. H. Yates, Esq., Superintendent, Government Press, Bangalore.*

I am in receipt of your letter No. 581—635, dated December 5th, 1911, together with copy of the draft report of your Committee, for which I am obliged.

2. I notice that you have addressed me as a member of the Committee. I was not aware of my being one; but if the fact of my not being a member does not disqualify me from complying with your request that I "favour the Committee with any observations and suggestions I may wish to make in regard to the proposed scheme," I am only too pleased to avail myself of the opportunity you afford me.

3. I will, practically, confine my remarks to the industrial part of the scheme, except to say that the scheme as a whole appears to me to be a very ambitious one for an initial step. The Report says (para 15, p. 5) that the Committee's main object " is to bring every form of education within the reach of the classes of people who desire it; in a crude form at first, and more highly developed forms as resources permit and the importance of the subject begins to be understood." In other words, the Committee's intention is to lay a foundation, and then build upon it as circumstances indicate. My opinion is that the foundation stage should receive the greatest attention even to the exclusion of the "more highly developed forms," at least for some time to come. My ideal is that every child should be given a fair start in life by parents, if possible ; and failing the parents, then by the State. Uncultivated brains and uncultivated lands are alike so much loss to a nation.

4. I was for nearly twenty years a technical instructor in a school in England. The boys passed from the ordinary day school, which formed part of the institution, into the various workshops, *after they had passed the required educational standard.* When they had qualified themselves in the industry they were being taught, they were sent out to situations. So far as my own pupils went, I could never supply the demand from masters for them, and only last month an employer of several hundreds of men in India begged me, if possible, to send him one of my former pupils to fill a responsible post in his office, and thus (to quote his own words) " earn his eternal gratitude."

5. During the years referred to I trained a great number of boys, the majority of whom are now filling posts of responsibility in various parts of the world—India, West Indies, Assyria, Australia, New Zealand, and South Africa, as well as various towns and cities in Great Britain. Some have extensive businesses of their own, and some are editors or journalists.

6. I mention these facts in detail in order to emphasise the importance of foundation work. These boys had only an elementary education; but it was a sound one. Anything beyond that was added by themselves as they saw the need for self improvement. The public gave them a good start, and an opportunity of earning a comfortable livelihood ; and they were expected to be self-reliant and industrious and do their best. I started my working life in this way; and my son did much the same thing; only in his case a thorough technical education followed upon his school work.

7. May I say here in parenthesis that I am of opinion that the phrase in para 15, already referred to, will be objected to by any teacher worthy of the name. However elementary the education may be, it should be thorough so far as it goes, and not " in a crude form at first." This method of teaching has resulted in endless trouble. Half of my work consists in *unteaching* men (if I may use such a word). They have been taught crudely somewhere ; and when once this is the case it is a most difficult matter to get them on right lines.

8. In saying this, I have the working-class element of Mysore in my mind. If they can be given a similar opportunity to the boys I have referred to, I see no reason why they should not succeed.

9. So far as the boys now employed in the Government Press are concerned, as well as those who will enter it in future, I would suggest that they be given a good education in the three R's, and, if possible, the rudiments of drawing should be taught. Included in writing and reading should be a knowledge of Latin, Greek, and Anglo-Saxon roots. I have found these roots invaluable in my own case. The best proof-readers and examiners are the product of the composing room. The standing trouble in large printing offices in India is the want of good examiners. Make capable compositors, and you will then obtain good examiners.

10. I am not in favour of evening classes for working boys, although these are better than none at all. By the end of the day the boys are tired, or at least require a change of occupation. Anything in the way of industrial or technical education should be carried on during the day. This is the method now generally adopted in technical institutions in Great Britain. Some employers send their apprentices to these classes during the day, and pay their fees, so conscious are they of the immediate benefits accruing thereby.

11. I am of opinion that Mysore State is very far behind in the printing industry, both in quantity and quality. Only a small percentage of the printing required by the public is done in it. The work goes to England, or else is sent to Bombay, Madras, or Mangalore. The leading printing firms in Madras are flourishing, and usually have more orders than they can cope with. Why, then, does not Mysore endeavour to at least do its own work? The best answer to this is the reply of Madras as to why it does so well; and Bombay would doubtless reply similarly. It is because these cities have imported efficient teachers, whose influence during many years is now being so markedly felt. The same result is plainly seen in Mysore City, where the Wesleyan Mission Press is doing good work and making good workmen. Orders are received there from the most distant parts of India. The same thing will happen in Bangalore as soon as men are carefully educated for the work they are destined to do. Until they are, capitalists will be slow to embark their money in the business. Mysore artizans are quite equal to Madras artizans, given equal chances. Indeed, I am surprised daily at the skill they show in spite of the many disadvantages they have to face.

12. The most remarkable illustration of the effect of efficient technical teaching is to be seen in Bombay. I am told that in the "Times of India" office, some thirty European workmen are now employed. The result is seen in its excellent Christmas numbers, and in its weekly illustrated edition. Mysore need scarcely go so far as this; but it can send more of its men to England to be thoroughly trained in their respective callings. These men will in their turn impart their knowledge to their fellow-countrymen, and gradually the status of the men and the quality of their work will be raised, and the money now flowing out of the State will be retained, to say nothing of work being imported into it.

13. This is my ideal, so far as my own business is concerned. I leave other men to deal with other industries. But the same weaknesses which I have pointed out in one direction appear to exist more or less in all directions. Fortunately the State is conscious of them; and inasmuch as a knowledge of a disease is half the remedy, I am very hopeful that a cure may be speedily effected. And to this end I would emphasise what your Committee have so well said in para 80, p. 21:—"The habits of punctuality, diligence and discipline (which should include neatness) should be specially inculcated. The student should be taught to cultivate a sense of honour and to understand his duties and relations to his fellowmen and the State."

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*Copy of letter No. 454, dated 13th January 1912, from Rai Bahadur M. Muthanna, Esq., Conservator of Forests in Mysore.*

I have the honour to acknowledge, with my best thanks, the receipt of a copy of the draft Report drawn up by the Committee appointed by Government for the elaboration of a scheme for the improvement of Industrial Schools in Mysore and to convey, as desired, my observations and suggestions thereon as follows:—

In the first place, I have to congratulate the Committee upon the thoroughness and ability with which it has dealt with the subject and upon the lucidity of the Report itself.

The terms of the reference of Government to the Committee limit its deliberations to the management and improvement of the existing Industrial Schools, but the Committee has travelled beyond this limit and has reported upon a comprehensive Scheme of Technical and Industrial Education for the State. They may be excused for doing so, for the temptation to deal exhaustively with a subject of such vital importance to the future progress of the country when an opportunity presented itself, must have proved irresistible to it, particularly to its accomplished President who, fresh from his visit to the countries of the West and Far East and from a close personal study of their Institutions, must be chafing at the backwardness of his own native land. The spirit pervading the Report is deserving of all praise. Though some of the proposals may seem too ambitious and some of the objects sought may appear beyond the reach of the present and the next succeeding generations, the ideal kept up throughout the Report will commend itself to all true patriots.

With these remarks, I shall proceed to deal with the various subjects reported on by the Committee.

### I. College of Technology in Bangalore.

2. The first place is given to the proposal for establishing a high class College for giving instructions in higher Engineering and Industrial Arts, the object being to train a body of men able to take charge of large industrial and commercial concerns. It seems to me that such a College is not needed at present, firstly because the very highest training in Civil and Mechanical Engineering can now be secured at a trifling cost to our students in the existing Indian Colleges; secondly because the existing industries and those that may be brought into existence in the near future would require only a limited number of men, who could be deputed to Europe and other countries to prosecute their further studies after passing examinations in the Indian Colleges and in the Technical Institute proposed under Section V. Further, it may be noted that advanced training in applied sciences and chemistry is imparted in the Indian Research Institute (popularly known as Tata's Institute) to which Mysore students have access.

The capital expenditure on the proposed College is estimated at Rs. 3 lakhs and the recurring annual expenditure at Rs. 80,000. It appears to me that such expenditure is not justifiable until we have made some progress in Technical and Industrial education. For our present needs and for some years to come, an Institute such as is proposed under Section V of the Report seems sufficient.

### II. Chamarajendra Technical Institute in Mysore.

3. The establishment of an Institute for providing secondary Technical and Industrial Education seems a necessity, and I heartily support the recommendation of the Committee for amalgamating the existing Engineering and Industrial Schools in Mysore and for opening a fully equipped and staffed institute in their place. I would exclude Civil and Mechanical Engineering from the curricula as a far better training than we can provide in these subjects can be had in Upper Subordinate Engineering Colleges in British India. I would accordingly confine our attention to the teaching of the subjects enumerated in paras 36, 38 and 39 of the Report.

8. In saying this, I have the working-class element of Mysore in my mind. If they can be given a similar opportunity to the boys I have referred to, I see no reason why they should not succeed.

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The capital expenditure on the proposed College is estimated at Rs. 3 lakhs and the recurring annual expenditure at Rs. 80,000. It appears to me that such expenditure is not justifiable until we have made some progress in Technical and Industrial education. For our present needs and for some years to come, an Institute such as is proposed under Section V of the Report seems sufficient.

### II. Chamarajendra Technical Institute in Mysore.

3. The establishment of an Institute for providing secondary Technical and Industrial Education seems a necessity, and I heartily support the recommendation of the Committee for amalgamating the existing Engineering and Industrial Schools in Mysore and for opening a fully equipped and staffed institute in their place. I would exclude Civil and Mechanical Engineering from the curricula as a far better training than we can provide in these subjects can be had in Upper Subordinate Engineering Colleges in British India. I would accordingly confine our attention to the teaching of the subjects enumerated in paras 36, 38 and 39 of the Report.

Only students who have gone through the Matriculation or the School Final course and the Overseers' and Sub-Overseers' Tests of any of the Indian Engineering Colleges may be declared eligible for admission into the Institute. I would also raise the scholarships as follows :—

| | | | | |
|---|---|---|---|---|
| 1st year | ... | ... | ... | ... Rs. 10 per mensem. |
| 2nd to 5th year | ... | ... | ... | ... „ 15 do |

The course will be one of five years.

In the curricula, one important subject, *viz.*, Sculpture, Inlaying, Stone-hewing and Polishing has been omitted, apparently, through inadvertence. There is a splendid scope for the creation of a flourishing industry in this line in Mysore where stones suitable for building and decoration, carving and sculpture are met with in unlimited quantities.

I would also suggest that a couple of picked passed students of the Institute be deputed to Europe and Japan every year to complete their education, so as to fit them to serve as Teachers and Managers of Factories and Industrial and Commercial concerns.

An annual expenditure of Rs. 73,000 is estimated for maintaining the Institute. Although this limit is not likely to be reached within the next five years, it is not too high a sum to pay for providing the country with men trained in various industries.

### III. Improvement of existing Industrial Schools.

4. I would abolish all the State and Aided Schools, except the two at Kolar and Tumkur and establish one central school at Channapatna for training students in the following subjects :—

Lacquer work, Musical wire-drawing, Cabinet-making, Carpentry, Smithy and Weaving.

The admission into the school will be restricted to the children of artisans, and the course will be one of five years. Each subject will be taught by a Specialist in his own line and not by the present class of amateur teachers and maistries.

Reading, writing, arithmetic and drawing will be compulsory in the first three years. Each student must get a scholarship of Rs. 5 per mensem in the first year and of Rs. 7 in the subsequent years, besides accommodation.

A school equipped in the manner sketched above ought not to cost more than Rs. 1,500 per mensem.

### IV. Model Technical Schools.

5. I approve of the course of instruction prescribed for these schools, but would eliminate the following subjects:—Electrical Engineering and Mining which could be better taught in a properly equipped school.

As regards cost, it would, perhaps, be not necessary to maintain such a highly paid staff as proposed. The students trained in the Chamarajendra Technical Institute will probably be content with one-half or one-third the proposed pay.

### V. Craft Schools or Lower Industrial Schools.

6. I attach the highest importance to the teaching of rural crafts and industries to the sons of raiyats, and, therefore, welcome the proposal for opening such schools. Instead of opening separate schools for this purpose, I would suggest that special classes for the teaching of the subjects enumerated in para 72 be opened in the existing Hobli Schools under teachers trained in the Chamarajendra Technical Institute or the Central Industrial School at Channapatna. If this arrangement is adopted, the cost would be reduced to a minimum. As an inducement to children to take up the study of the industries mentioned, I would have four scholarships of one rupee each per mensem in each Hobli School. The course shall be one of three years and the time devoted to the special subject shall not be less than three hours per diem.

Accession No.



## VI. Girls' Industrial Schools.

7. I rejoice to notice that the training of the future mothers has not been forgotten as is usually done. The course of instruction prescribed for them seems suitable. As in the case of Lower Industrial education, I would have no separate schools for them, but would teach the various subjects in the existing Girls' Schools. In order to encourage girls to continue their studies until they acquire a fair knowledge in the particular subjects they may take up, I would propose that three scholarships be granted in each Girls' School on the following scale:—

| | | | |
|---|---|---|---|
| In the first year | ... | ... | One rupee per mensem. |
| In the second year | ... | ... | Two rupees per mensem. |
| In the third year | ... | ... | Three rupees per mensem. |
| In the fourth year | ... | ... | Three rupees per mensem. |

Such girls as have passed through the entire course will be eligible for appointment as teachers in Girls' Schools.

## VII. Indian Scholarships.

8. I would discontinue the scholarships for Civil Engineering and Medicine, as the stage for encouraging students to take up such studies has passed, and as dozens of youths are ready to undergo them without State aid.

Upon the opening of the Technical Institute at Mysore, it will also be possible to discontinue all the scholarships except those for Agriculture and perhaps for Mechanical Engineering.

## VIII. Foreign Scholarships.

9. I would discontinue all scholarships for scientific research, as the necessity for them has ceased with the opening of the Indian Research Institute, and restrict them to Technical and Industrial education. The selection of students for these scholarships may be confined to the following :—

(*a*) Passed students of the Indian Research Institute.
(*b*) Passed students of the Chamarajendra Technical Institute ; and
(*c*) Students who have passed with high distinction in Mechanical Engineering in any of the Indian Colleges.

## IX. Suggestion for Providing Funds for the Establishment and Maintenance of the proposed Technical and Industrial Schools.

10. The Committee is fully aware that there are certain departments of the State, the necessity for which does not exist or has ceased. They might be retrenched or abolished altogether without impairing the progressive efficiency of the State. One of the departments under reference, at any rate, does not exist even in any of the Presidencies. It would be worthwhile, in my humble opinion, to take a stock of the results of the labours to these departments since their creation to see whether they have accomplished any useful or beneficial purpose in return for the lakhs spent upon them. I refrain from commenting further on this subject, lest I should be trespassing on forbidden ground. I have no doubt however, that the Committee will gladly welcome suggestions as to the ways and means for meeting the cost involved by their proposals without making demands on the resources of the State.

*Copy of Memo on Technical Education in Mysore, by H. J. Bhabha, Esq., M.A., Retired Inspector-General of Education in Mysore.*

1. I regret I am unable to put down in a short time all that I have to say on the subject of Technical and chiefly Industrial Education in Mysore. I here state a few principles which do not seem to have been insisted upon in the scheme of Technical Education which has been prepared by the Committee and to make a few suggestions and remarks.

2. To spread Technical Education and make it a success the first thing necessary is to coordinate it with the system of general education, and nothing can achieve that purpose so well as the introduction of manual instruction, drawing and modelling into all schools of general education. To enable the department to introduce these subjects into all schools the only effective way is to train all teachers in these subjects in the Normal Schools. The Mysore Normal School is doing admirable work, but I fear it has not been sufficiently well appreciated by Government or the public. It requires enlargement and better housing and better equipment. Although it is the one institution that can exercise the most wholesome influence on the whole system of education, it is ill supplied with funds and its present accommodation is both scandalously inadequate and poor. It is absolutely necessary to add an English Department as soon as possible to this institution, and to give it a large and suitable building in a healthy locality with sufficient accommodation for well conducted and well kept hostels and recreation grounds. It is this institution that will develop the instincts and natural aptitudes for manual and industrial work in all young people. And no expenditure can be too large and no efforts too great to make it as efficient for the training of as many teachers as possible in manual instruction, drawing and modelling. To prepare an adequate number of teachers in these subjects for all primary schools and classes, every district at headquarters should be provided with a Lower Secondary Training School, the Mysore Normal School being called a Training College and the Headmaster or Principal with the occasional help of his staff being given general supervision over the District Normal Schools.

3. Another important point which has been lost sight of in the scheme is the provision *for agricultural schools and instruction in the elements of agriculture* in all the primary schools especially those in villages. Agriculture is the principal industry of the Province, and the foundation of a knowledge of the science and art of agriculture must be laid in our primary schools. Every village school should be provided with at least 3 acres and every taluk school with at least 5 acres of land for school gardening and experimental farming. In the school gardens and farms, the elementary principles of agriculture should be taught by trained teachers. But their chief object should be to train boys in habits of careful observation and reasoning in all fundamental matters relating to agriculture besides an acquisition of scientific and accurate knowledge of the principles of agriculture. It is therefore absolutely necessary to improve the teaching of theoretical and practical agriculture in the Mysore Normal School. A great deal has been already done in the school by enthusiastic teachers to ground the vernacular teachers in the theory and practice of agriculture and methods of conducting agricultural experiments. But the teaching requires to be better systematised and made more practical even at the cost of more time for instruction and more money.

4. I hear there is some idea of opening an Agricultural College for Mysore. No doubt such a College will in course of time be a necessity, but what seems to be an immediate want is the organisation of agricultural schools at District headquarters and a large experimental farm in Mysore or Bangalore. Dr. Mann, Principal of the Agricultural College at Poona, would be the best person to consult for the organisation of such District Agricultural schools. The Principal of the Coimbatore College and the Agricultural Lecturer of the Mysore Normal School should also be consulted. In these Agricultural schools may be taught some or all of the following rural industries: rough carpentry and black-smiths' work for making carts and ploughs, basket and mat making, rope-making, weaving, sericulture, the keeping of honey bees, pottery, making brass and copper vessels.

5. While on the subject of Normal Schools, I would add that there is an *absolute want of a Training College* for Women Teachers. In such a College sewing, cookery, the elements of Physiology and Hygiene, first aid, the care of infants, nursing, and domestic science should be taught besides the other usual subjects for women teachers. If all female teachers were trained and taught most or all of these additional subjects, it would be possible to teach these subjects in all Girls' Schools, and by such teaching a great revolution would occur in the happiness of the home, while practical industries suitable to Indian women would be encouraged. So much money has been wasted for many years on the Maharani's College by an irresponsible Committee for purposes of show, that if half of that money had been spent on a good training College for women, it would have done far more good to the community than three Lady graduates and a few Matriculates who are the chief tangible result of the enormous expenditure.

6. The classification of technical institutions into Higher, Secondary and Primary at p. 3 of the scheme is more ideal than practical, and is sometimes put forward by those who import the classification of schools of general education into the department of technical instruction. A more practical classification would be somewhat like the following :—

1. Technical Colleges and Technical High Schools such as exist in Europe.
2. Schools for Civil and Mechanical Engineering like the Jubilee Technical Institute of Bombay.
3. Schools for Chemical and other superior industries.
4. Commercial Schools.
5. Art Schools and Art Trade Schools.
6. Trade or Industrial Schools for artisans.
7. Rural Industrial Schools which may be combined with district Agricultural Schools or Normal Schools.

7. Taking this rough classification, the highest kind of Technical Colleges such as Civil, Mechanical or Electrical Engineering Colleges, Agricultural Colleges, or Colleges of Science like those in European capitals or even in the Presidency towns of India seem to be out of question in the present state of Mysore. In judging what kind of technical institutions are best suited to a State or Province it is necessary to bear in mind the state of general education and advancement and the immediate needs of the people as well as the resources available for technical education. The few Engineers, Agricultural Experts, and other Scientific men can be easily trained with the help of scholarships in other parts of India or Europe as at present.

8. There is the making of a good school for Civil and Mechanical Engineering in the Mysore Engineering School and the Mysore Industrial School. With better equipped workshops, and a larger staff of scientifically trained teachers specially employed or borrowed from the Public Works Department, the Mysore Technical Institute formed by the amalgamation of the above named two schools would supply all the wants of the province for some time to come and train men for subordinate posts in Civil, Mechanical and Electrical Engineering, if an Electrical department can be added. The growing needs of the Province in the three departments of Engineering have to be supplied. The Engineering School has already done excellent work in turning out a useful body of Sub-Overseers and Draughtsmen. The mechanical Department of the Mysore Industrial School can without much difficulty be developed so as to turn out fairly good mechanics. And an Electrical Engineering Department may be added, so that the Mysore Technical Institute may become as efficient in Mechanical and Electrical Engineering as the Jubilee Technical Institute of Bombay.

9. The school of Technology to be opened in Bangalore should be one for chemical and other industries, such as dyeing, manufacture of soap and candles, manufacture of perfumes, manufacture of spirits, manufacture of oils, paints and varnishes, manufacture of glass, cement manufacture, sugar manufacture, sulphuric acid manufacture, tanning, calico printing, horology, geological prospecting, pharmacy, etc. There is an unlimited scope for the expansion of such a school. New superior industries of which the need may be felt as the wealth

of the people increases and the standard of comfort rises may be added to the curricula of the school in course of time. New industries such as the manufacture of paper from bamboos may also be taken up.

10. About three or four Commercial schools for teaching shorthand, type-writing, commercial arithmetic, correspondence, business forms, book-keeping, accountancy, etc., may be newly opened, or the existing aided schools may be further developed.

11. The need of art trade schools is at present limited. Schools for wood carving, inlaid work, sandalwood carving, stone carving, engraving, gold and silver smiths' work, ornamental leather work, ornamental iron and brass work, lace-making and embroidery, superior carpet making, etc., may be opened from time to time as funds permit. Higher drawing and design as well as modelling and painting will have to be taught in all these schools, or the subjects of art may be taught separately in art schools.

12. Trade or Industrial schools for artisans' trades, such as chair making, picture frame making, ordinary furniture making, cabinet manufacture, the making of brass copper and bell-metal vessels, rattan work, tile and brick making, bricklaying, mat and chick making, making of glass bangles, lacquer work, lac manufacture, ordinary pottery, etc., should be established at centres where there are facilities or there is a demand. There is a very large scope for weaving schools in Mysore in which the use of improved flyshuttle looms can be taught. The great success of the existing weaving schools is very encouraging. If ready made warps can be supplied to hand loom weavers from one or more central factories, the work and profits of the weavers would greatly improve.

13. The Rural Industrial schools for the making of carts, ploughs, cloths and cumblies, ropes, shoes, leather harness of cattle, etc., may be opened separately in large villages, or one or more of these industries may be added to the ordinary village school as teachers specially trained in them in Normal schools become available.

14. The curricula of the different kinds of schools have to include the requisite portions of arithmetic, algebra, mensuration, physics, inorganic chemistry, qualitative and quantitative analysis, and will require to be carefully arranged. Schools in which several industries requiring the same kind of preliminary instruction are taught will of course have common classes for all or most of the pupils. Drawing and modelling also will have to be taught in common to all, unless the pupils come prepared in these subjects from schools of general education.

15. I do not think it is possible to arrange before hand a stereotyped scale of establishment for these schools. Each school should have its own budget, care being taken to see that no money is wasted.

16. At one time the Mysore Government thought that all industrial schools should be self-paying. This I know is an impossibility as learners must waste a good deal of material, wear out tools faster than ordinary artisans and take much longer time over their work than proficient artisans. Government should be satisfied if a fair proportion of the cost is recovered. No fees should be charged in any of the technical schools, and only a few scholarships should be provided for those pupils who show great natural aptitude and industry. The rest should be paid the whole or larger portion of the value of the work done by them whenever possible.

17. The technical scholarships at present given by Government for study in schools outside of Mysore whether in India or Europe should be continued.

18. For the control of industrial schools, the Inspector-General of Education should be given one or two special assistants on Rs. 300 raising to 500 according to the amount of supervising and inspecting work that has to be done. Mr. G. Subbuswamy Iyer, Headmaster of the Mysore Industrial School, would make a good Inspector of Industrial Schools, and one other Inspector acquainted with chemical industries may also be appointed.

19. I see no need of two permanent travelling Professors or Commissioners for the advancement of such industries as are contemplated. Occasional visits to Europe of the Inspector-General and his Assistants in accordance with the rules for study leave would be amply sufficient for observing the advance of industrial and technical education in Europe and America.

20. The whole cost of the second and third classes of schools and of art schools should be borne by the State Funds, the greater portion of the cost of commercial schools should be recovered from fees, and Government should be satisfied if a portion of the cost, varying according to the locality and advancement of the people, of all trade or industrial schools is recovered as at present from the sale of articles produced. A portion of the cost of commercial and trade schools may well be borne by the Local Funds. This question of providing the cost from State and Local Funds, however, requires careful consideration in detail.

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*Copy of letter dated 31st July 1912, from D. Venkataramayya, Esq., B.A., Advocate.*

Many thanks to you for the draft report of Industrial Schools' Committee forwarded to me for observations and suggestions. While congratulating the Committee for the scrupulous care and attention bestowed on the subject, I wish to bring to your notice a few points on which the Committee may bestow their further attention. It is only in the profession of law there is an opening for young men in a recognised form to make a living without depending on Government service. In the absence of such a recognition regarding the young men trained in the Colleges to be brought into existence under your scheme, the standard fixed for admission into the technical colleges as the passing of Matriculation and Intermediate Examinations is, in my opinion, too high. It is not quite clear whether your Committee considers a knowledge of the vernaculars as sufficient for admission into the Art and Craft Schools. If the scheme is to be worked with success according to the existing state of society in Mysore, it should not be open to the criticism that there is no scope at present for employment of the young men trained in the Colleges. I would, therefore, recommend that this draft report, excellent as it is, should be placed before the Inspector-General of Education with a view to get his co-operation in the entire remodelling of the curriculum of studies in all the Primary and Secondary Schools of the State so as to be in harmony with the special branches of study now recommended by the Committee. The Lower Secondary and School Final Examinations curricula may also be remodelled on the lines of the recommendations made by your Committee. It is somewhat difficult for me to conceive as to how the curricula of studies either of the Madras University or of any other Indian University could be taken advantage of without waste of time and energy to fulfil the requirements which your Committee requires to be commenced after a young man has had education in a school or college for a period of about ten years to pass the Intermediate Examination without any acquaintance with the subjects which are proposed to be taught in Technical Colleges. This aspect of the question will strongly lend support to the idea of having a University for Mysore. Degrees may be conferred in several branches recommended by your Committee. The passing of an examination in one or two papers in literature should enable a young man to obtain a degree in Arts also. The defect in the existing scheme of conferring degrees by the Madras University becomes patent when we see a young man dubbed with the degree of B. A. is certainly not known to the public outside, as having taken Botany, Geology, Chemistry, Physics, Mathematics and other subjects. The scheme of the Madras University has throughout been more of a literary kind even in science than of application of science to practical purposes. The absence of degrees conferred in science alone by the Madras University to distinguish the degree from the B. A. and M. A. degrees is by itself a sufficient recommendation for taking up the question in a serious spirit by your Committee for developing a scheme for establishing a local University. If the curriculum of studies is to be remodelled young men who cannot

afford to continue higher studies will take up occupations which pay them best; those who can afford higher education will have a combination of technical and general education to enable them to fight the battle of life in or outside Mysore till a large number of industries spring up in Mysore itself.

I thank you once more for giving me an opportunity to state my views in the matter.

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*Copy of letter dated 21st February 1912, from M. Shama Rao, Esq., M.A., Officiating Deputy Commissioner, Tumkur.*

Your D. O. No. 581—655, dated 5th December last, and I thank the Committee of Industrial Education for kindly giving me an opportunity of reading an advance copy of their report. I beg to congratulate the Committee on the production of a scheme which seems to have been laid out on very careful and wellthought lines. To start with, the establishment of a Technical College at Bangalore and of an Institute at Mysore may be undertaken. I am of opinion that the improvement of the existing Industrial schools at the places named may be put off till the first batch of trained men from the institutions to be established at Bangalore and Mysore become available. The causes for the unsatisfactory condition of the present Industrial Schools are deeper and require investigation. The Committee are probably aware of this aspect of the question.

With regard to the minimum qualifications of students for admission, I would admit plucked F. A.'s and plucked Matriculates. Between these and successful F. A.'s and Matriculates, there will not be much difference so far as technical training is concerned. In my opinion it is the former that have to be taken in hand more than the latter.

I hope that the scheme will meet with early approval at the hands of Government, later on, I believe it will become necessary to establish business concerns also to provide employment for the trained men. They will have to be provided with facilities for obtaining capital on reasonable terms. It is highly desirable that these questions also should receive attention from now.

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*Copy of letter No. 175, dated 19th February 1912, from P. R. W. Wetherall, Esq., Deputy Commissioner, Hassan District.*

Adverting to your letter No. 581-635, dated 5th December 1911, forwarding for my perusal and any observations and suggestions, a copy of the draft report prepared by the Industrial School Committee, I have the honor to acknowledge with thanks the receipt of the draft report, from which it is obvious that the Committee have spared no pains in studying the existing condition of Industrial and Commercial Education in the State and with the object of laying the Industrial and Commercial education on a sound basis, the Committee have proposed suitable schemes with elaborate workable details.

2. What appears to be specially required at present, in Mysore, is to formulate a course of study in industries, etc.. for our rising generation on scientific lines, so that the crude and antiquated system may be replaced by modern methods by using time-saving machinery and improved patterns of implements. The development of skilled labour in the country would go a great way towards tapping the unworked resources of the State, and many young men whose time is wasted on unsuccessful attempts made on no systematic lines and without perseverance, will find ample scope to improve themselves and also society in general, by their example. Moreover, business habits and perseverance becomes a matter of necessity, in order to fit them for future keen competition, the result of Industrial and Commercial awakening in India.

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3. The establishment of a College of Technology in Bangalore, the improvements proposed for the existing Industrial Schools in the State, the starting of models of Technical Institutions for boys and girls, as also for grown-up persons, the suggestion of appointing competent Itinerant Lecturers, grant of scholarships for industrial training in foreign countries, etc., are detailed and explained in a masterly way so as to be appreciated by every well wisher of the country. Considering the prospective advantages which the proposed schemes are to confer upon the State, the estimated cost appears moderate.

4. I am strongly in favour of all the proposals made by the Committee, and I trust that the Government will be pleased to accord sanction to the same.

5. In conclusion, I would suggest for consideration of the Committee the advisability of starting a Fortnightly Technical and Industrial Magazine for distribution by District Committees, to such persons in each district who may be known or ascertained to take a lively interest in Technical and Industrial matters.

6. Owing to unavoidable pressure of Jamabandi and other work, I regret that your reference on this subject was not earlier replied.

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# SCHEME OF TECHNICAL EDUCATION IN MYSORE.

Report by the Committee appointed in Government Order No. 3585-9—Edn. 462-09-2, dated 28th October 1910.

SEPTEMBER 1912.

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# TECHNICAL EDUCATION IN MYSORE.

## I. Preliminary.

The Government Order of 28th October 1910, reproduced in the Appendix, appointed this Committee for the purpose of formulating a definite policy and plan of work for developing industrial education within the State. We were asked to consider the subject in all its aspects and submit a full and detailed report laying down a comprehensive programme with defined courses of training.

2. The first meeting of the Committee was held on 25th November 1910, at which, at the request of the Committee, Mr. V. Rangaswamy Iyengar undertook the duties of Secretary to the Committee. Work was interrupted for a time by the departure of Mr. Weir on leave from 19th April 1911. On his return, Mr. Weir attended a meeting, on 27th June 1911, by which date the Committee had formulated most of the recommendations embodied in the report.

The sudden death of Mr. Weir on 31st July 1911 deprived us of the services of a most valued colleague. Before proceeding with the report, we desire to place on record our high appreciation of the active interest Mr. Weir evinced in our work and our profound regret at his premature death.

3. We have found some difficulty in devising a programme, which, while satisfying the requirements of the Government Order as regards comprehensiveness, would at the same time be well within the limited resources of the State. At an early stage of our deliberations, we came to the conclusion that an annual additional outlay of Rs. 3 lakhs would be a reasonable expenditure for the development of industrial education in the present financial circumstances of the State.

As complete institutions cannot at once be established for every form of technical or commercial education, we have thought it necessary to content ourselves with recommending the establishment of two large institutions, one in Bangalore and the other in Mysore. Even these will not have all the equipment necessary according to western standards for a long time to come. But we believe that, by laying down a syllabus and appointing a few competent instructors, we would be making at least a commencement in providing specialised training for boys anxious to prepare themselves for industrial occupations.

4. In the years 1874-78, there was an Engineering School in Bangalore, in which higher education in engineering and forestry was given, and that education sufficed to train officers, one of whom officiated as Chief Engineer of this State a little while ago and another has been occupying the office of the Conservator of Forests in Mysore. And yet the College of the Seventies employed only one European Executive Engineer and one Indian Lecturer. Conditions are more favourable now and more money can be spent on technical education. If, in some of the subjects, the training given locally is found to be inadequate, it may be supplemented by a more extended course in one or more of the leading institutions of Western countries.

## II. Existing industrial schools.

5. There are at present seven Government Industrial Schools in the State. The one at Mysore was started in March 1892. The other schools were started under Government Order No. 14668-77—Edn. F. 14-96, dated the 7th April 1903, which says: "The object in view should be not the imparting of any ideal, theoretical or scientific course of instruction but the teaching of such industries and trades on improved methods as are adapted to supply the present wants of the people, such as carpentry, weaving, silk-rearing, iron work, rattan work, lacquer work, etc., and to turn out a number of pupils fully equipped with the means of earning their livelihood."

The weaving schools were expected to train young boys in weaving various kinds and patterns of cloth on fly-shuttle looms, so that the weavers of the locality concerned might introduce improvements in their looms and be enabled to increase their profits by the resulting saving of time and labour.

6. The Mysore School has a full time Superintendent helped by an Assistant and maistries. The other schools are looked after by persons who hold appointments in the local High or Anglo-Vernacular Schools. These men are not able to give sufficient time to their additional duties and the schools are virtually left in charge of maistries. In spite of these defects, the weaving sections of these new schools have done good work by demonstrating to the public the advantages of using fly-shuttle looms.

Cloths of finer counts unknown before are now produced. In Melkote and Hole-Narsipur, silk and cotton yarn are dyed locally to a certain extent. The school at Channapatna is doing very good work. The Mysore school has developed in all directions.

7. Besides the above, there are eleven aided and three private schools. Carpentry is taught in eighteen schools, blacksmith's work in four, rope-making in two, and each of the following industries in one or more institutions:—

(1) Pottery and tile-making.
(2) Fitter's work.
(3) Masonry.
(4) Agriculture.
(5) Lacquer work.
(6) Musical wire-making.
(7) Nature imitation art in wood.
(8) Embroidery.
(9) Lace-making.
(10) Knitting.
(11) Brass work.
(12) Drawing in all branches.

Of the aided institutions, the schools at Kolar and Tumkur have done excellent work.

8. The expenditure incurred on Government institutions excluding materials used in workshops, amounted in 1910-11 to Rs. 32,262. The grant paid in aid of industrial schools amounted to Rs. 8,710. Thus the total annual expenditure, according to the accounts for 1910-11, amounted to Rs. 40,972 (*vide* Appendix II).

9. Notwithstanding the good work they are doing, we consider that the Government Schools are not maintained in a proper state of efficiency and need to be reorganised.

### III General outline of institutions proposed and their object.

10. It is suggested that facilities should be provided for giving instruction in all the three grades of technical education, higher, secondary and primary. In the elementary courses, instruction should be given to the artisan classes and to people actually engaged in business and trades, such as—

Building,
Carpentry,
Furniture-making,
Weaving,
Shoe and boot-making,
Tailoring,
Manufacture of carpets,
Mats,
Cooking utensils (brass, copper and bell-metal),
Artware,
Pottery,
Printing, etc.

The secondary technical education should have for its object the training of mechanics, assistant foremen, teachers for industrial schools, etc. In addition to instruction in one or more trades, the men of this class should have some general training in correspondence, commercial arithmetic, elementary mechanics, physics and chemistry.

The higher technical education should qualify the students for the management of factories and other large industrial concerns. An attempt should be made to provide commercial and business training for men in all grades of occupations.

11. It is suggested that a College of Technology should be started in Bangalore to give instruction in engineering and in special industries. If, by reason of the equipment being inadequate, the instruction given in any subject is found to be defective, the students will have to finish their education in other superior institutions in British India or England or other foreign countries.

12. For secondary education, a model school of Technology should be maintained in Mysore. Government have already decided to start an institution of this kind, to be called "The Chamarajendra Technical Institute," with which will be amalgamated both the existing Engineering School and the Industrial School in Mysore. A building at an estimated cost of Rs. 2,41,215 is under construction for this purpose and is expected to be ready early next year.

13. The existing industrial schools in the State should be improved and developed as far as circumstances permit.

14. For all classes of institutions to be started in other centres, model curricula, staff and approximate estimates are given. Any town which wants one or more institutions of the classes named may make its own selection from the given list.

15. In many towns and large villages, the cost of starting model institutions may be prohibitive. This difficulty may be overcome by establishing special classes

morning or evening, or a course of lectures. For instance, where a fully equipped commercial school cannot be started, one or two commercial classes may be provided in connection with an existing educational institution. When even this is found too costly, morning or evening classes for the same purpose, may be organised. When there is not much demand for such classes, lectures may be arranged for, for an hour or so, once to three times a week, merely to rouse interest in the subject. Where local lecturers are not to be had, itinerant lecturers may be appointed to visit given centres at periodical intervals. The main object is to bring every form of education within the reach of the classes of people who desire it, in some suitable form at first, and more highly developed forms as resources permit and as the importance of the subject begins to be understood.

16. The two large institutions proposed at Bangalore and Mysore should be maintained entirely at Government cost. If the districts wish to take a prominent share in the benefits, students should be sent up at the cost of Municipalities, guilds of tradesmen, weavers, etc. Government will also give a few scholarships to selected students.

17. It is recommended that the District Boards, Municipalities and other local institutions, as well as associations and guilds of tradesmen, be encouraged to start institutions or classes or organise lectures in subjects which, in their opinion, are calculated to multiply the occupations of the people or increase the volume of business in the locality. If the local authorities or inhabitants make up their mind to contribute a substantial share of the cost, Government should not hesitate to pay the balance and help to bring into existence the institutions needed.

## IV. College of Technology in Bangalore.

18. It is suggested that a College of Technology be established in Bangalore to give instruction in higher engineering and industrial arts.

Object.

The object of the institution should be to train students who have already received a fair amount of general education so as to qualify them for taking a leading part in the management of industries and commerce in the country. The training in commercial and economic subjects including systems of administration in foreign countries will be of great value to officers of Government who are likely to become heads of districts. Some of the trained students will be fit for recruitment to the State Public Works and Electrical Departments.

Curriculum.

19. The course including workshop practice and laboratory may be divided into three sections as under:—

(i) Higher technical education.
(ii) Instruction in special industries.
(iii) Higher commercial training.

### *(1) Higher Technical Education.*

20. The following subjects may be included in the first section:—

(i) Civil engineering, including sanitary and municipal engineering.
(ii) Mechanical engineering.
(iii) Electrical engineering.
(iv) Architecture and building construction.
(v) Economic geology and mineralogy.

Drawing should be given a prominent place in the first four divisions, and lessons should be given in photography. The detailed courses in pure and applied sciences might be settled by the staff when appointed. The instruction which the Institute of Research and the Central College may consent to give in these subjects to students of the College of Technology should be fully availed of, so that, as far as possible, there may be no overlapping of courses of study in the three institutions.

The course in this section should be one of three years for each branch, the first year's course being common to all and the remaining period being devoted to special training in the selected branch.

Students who have passed the Intermediate or First in Arts Examination may be considered eligible for admission.

*(2) Special Industrial Education.*

21. In this section, the College should, as far as possible, provide facilities for giving instruction in the following industries :—

(1) Textiles, dyeing, bleaching and printing.
(2) Ceramics and manufacture of glass.
(3) Tanning and leather work.
(4) Manufacturing of oils, paints and soaps.
(5) Sheet metal work.
(6) Brewing.
(7) Motor engineering.

The full course in this section should also be one of three years. The passed candidates of the technical schools may be considered eligible for admission to this section. The course of studies should be of the standard needed to train the pupils for employment as managers of mills or other similar posts or as headmasters of technical and industrial schools in the mofussil.

*(3) Higher Commercial Training.*

22. The subjects to be taught in this section should include some or all of the following :—

(1) Commercial mathematics.
(2) Accounting and auditing.
(3) Banking.
(4) Mercantile law and practice.
(5) Economics.
(6) Economic geography.
(7) Statistics.
(8) Political economy.
(9) Public finance.
(10) Public administration.
(11) Local and municipal institutions.
(12) Problems of transport and railways.
(13) Co-operative associations and organization of industries.
(14) Commercial history—History of industry and commerce.
(15) One foreign language, either German or French.

Some of the subjects under commerce should be of interest to officials and the general public. The lectures in those subjects should be open to the public as far as possible.

For officials and others who cannot attend during the day, special lectures may be given in the evenings.

The course in commerce should be one of two years. There may be one professor and one instructor for the present and the students may be supplied with the necessary reference books from the library.

The minimum qualification for admission for regular students should be the successful completion of the Intermediate in Arts or other corresponding examination.

*(4) Workshop Practice and Library.*

23. The present Public Works workshop should be developed and utilised for affording practice to the students of the college. A competent Superintendent should be appointed.

The library should contain books on civil, mechanical and electrical engineering, industries and commerce. The libraries of the Civil Engineers' Association and the Economic Conference may be developed and utilised for this purpose for the present.

Later on, a museum may be started in conjunction with the library.

24. As the resources of the State do not admit of the duplication of institutions, it is suggested that the existing workshops and libraries be developed and utilised so that the expense of providing new ones may be saved.

*Staff.*

25. Similarly, the State cannot afford to have a large staff of professors and teachers. Three or four highly qualified professors may be employed and the rest of the staff may consist of lecturers locally trained.

Having regard to the financial exigencies of the State, it is better to make a commencement with the institution with such staff as funds will allow at first. We have to choose between higher training with the aid of an inadequate staff or no training at all.

26. A professor for mechanical and electrical engineering, one for textile engineering, one for architecture and building and one for commerce, will be needed at once.

In order to save expense, some of the engineer officers stationed in Bangalore may be asked to lecture for a day or two every week.

For some time to come, the latest books and journals on each subject should be provided and the students left to acquire knowledge by studying them under the general guidance of the professors and the lecturers.

In a few subjects, instruction may also be given by means of special lectures either morning or evening, so that those who are interested in the development of particular industries for which the State cannot at present afford to provide regular courses in the College, may acquire some expert knowledge.

27. The cost of the staff may be estimated as under:—

| | Rs. |
|---|---|
| (1) Four professors, Rs. 500-800, average Rs. 650 per mensem ... ... | 31,200 |
| (2) Four lecturers, average Rs. 200 each per mensem ... ... | 9,600 |
| (3) Experts and demonstrators ... ... .... | 10,000 |
| (4) Miscellaneous staff ... ... ... ... | 6,000 |
| (5) Experiments in industries and commerce ... ... ... | 10,000 |
| (6) Workshop ... ... ... ... | 7,500 |
| (7) Library, museum, etc. ... ... ... ... | 5,000 |
| Total ... | 79,300 or |
| | say, 80,000 |

The expenses may be reduced by employing engineers and professors of existing colleges to give instruction for a few hours every week. They may be given some allowance for doing the work. The total cost for the next five years should not exceed Rs. 75,000 a year.

28. The whole of the staff at least for the next five years may be temporary and no member should be engaged for more than three years at a time. This is necessary for three reasons. The most important one is that Government will be able to sanction proposals speedily without the fear of imposing a permanent burden on the State. The establishment may be reduced after due notice if the finances of the State are found to be unequal to the strain. Secondly, it is not desirable to saddle Government with a large permanent staff, for whom employment will have to be found or compensation given, if it becomes necessary to dispense with their services. The third reason is that temporary men can be changed till properly qualified men are secured for our work. A permanent officer may often no doubt have a higher incentive for his work, but he is also likely to lose interest and become dissatisfied if he should not receive promotions as rapidly as members of other branches of the Government service.

29. The teaching staff will be expected to keep touch with experiments in industries and with the working of all technical and industrial institutions in the State.

*Capital Outlay.*

30. The college may have to begin work partly in hired buildings. A sum of about Rs. 3 lakhs will, for the present, suffice for opening the college. After a period of about 5 years, some additional expenditure on buildings and equipment may be necessary.

*Ways and Means.*

31. This institution should be maintained entirely from State Funds. Donations may, however, be accepted if public spirited gentlemen desire to contribute. Fees levied from students will, to a certain extent, supplement the State Grant.

*Administrative Control.*

32. The College should be under the direct control of a Principal or Director, who will work under the general guidance of a council consisting of Government officers and non-official gentlemen, the latter selected chiefly from among those connected with industries, manufactures or trade.

## V. Chamarajendra technical institute in Mysore.

33. The proposed Chamarajendra Technical Institute at Mysore, which will be formed by the amalgamation of the existing Engineering and Industrial Schools in that city, should consist of three sections :—

(i) Elementary engineering including architecture.
(ii) Technical.
(iii) Industries and crafts.

### *Engineering Section.*

34. Candidates seeking admission into this section must have passed the Matriculation or the School Final Examination.

Instruction should be imparted in—

1. Civil engineering including architecture (buildings, roads, irrigation and sanitation).
2. Mechanical engineering.

The students should be given a certain amount of training, in the workshop, in building construction and in business correspondence and estimating. The course should be one of three years.

### *Scholarships.*

35. Three scholarships of Rs. 7 and two of Rs. 6 each at the end of the first year, and two of Rs. 10 and two of Rs. 9 each at the end of the second year may be awarded to the first two persons on the list of successful candidates in each of the two branches.

### *Technical Section.*

36. Candidates seeking admission into this section, must have passed the Matriculation or the School Final Examination. The subjects of study should be :—

1. Drawing.
2. Mathematics.
3. Elementary physics.
4. Elementary chemistry.
5. One of the following special subjects :—
   (*a*) Machine work.
   (*b*) Weaving and dyeing.
   (*c*) Photography including process work.
   (*d*) Commercial subjects such as book-keeping, business correspondence, shorthand and type-writing and banking.
6. Workshop practice.
7. Gymnastics and drill.

The course will be one of three years.

37. Intelligent and capable students desirous of becoming foremen in factories may be given a further course of one year in practical work.

Four scholarships of Rs. 5 each at the end of the first year and four of Rs. 7 each at the end of the second year may be given to the first boy in each of the groups.

### *Industries and Crafts.*

38. Sons of artisans and boys of other classes (who are unable to continue their studies and who have no other means of earning their livelihood) may be admitted into this section to learn a trade.

Instruction may be imparted in any one of the following crafts :—

(*a*) Cabinet-making.
(*b*) Carpentry.
(*c*) Carving (wood and ivory).
(*d*) Basket and cane work.
(*e*) Smithy work.
(*f*) Machine work.
(*g*) Fitters' work.
(*h*) Foundry work.
(*i*) Sheet metal work.
(*j*) Printing.
(*k*) Weaving and dyeing.
(*l*) Brick work and masonry.
(*m*) Engraving.

39. As the school develops, some of the following subjects may be selected and added to the course of instruction :—

(*a*) Building construction.
(*b*) Land surveying.
(*c*) Plumbing.
(*d*) Carriage building.
(*e*) Painters' work.
(*f*) Electrical work.
(*g*) Motor driving.
(*h*) Boot-making and leather manufacture.
(*i*) Watch and clock-making.
(*j*) Typography.
(*k*) Tailoring.
(*l*) Pottery.

*General Subjects.*

40. A knowledge of the Vernacular, English and Arithmetic up to the Lower Secondary standard may be imparted. The other general subjects may be :—

Drawing.
Business methods.
Modelling (for a few selected pupils).

The course should be one of three to five years in accordance with a progressive course of studies divided into 3 to 5 sections to suit the respective courses.

*Scholarships.*

41. Boys seeking admission into the first class of this section should pay fees for three months, at the end of which they may get the scholarship of the class, if they are regular in attendance and hard working and if scholarships be available. If the boy be an artisan, he should be given scholarship from the date of his admission. A student seeking admission with previous knowledge of the industry may be taken into the standard for which he is fit on payment of a fee for one month. He should get the scholarship of the class for which he is fit from the second month. All students should bind themselves to attend the school continuously for a period of at least three years.

42. Pupils of other schools may be given instruction in drawing alone. The rates of fees for the different standards may be fixed after the institution is started and is in working order.

There may be evening classes in drawing and lectures in a few special subjects for artisans working outside.

43. Classes for imparting instruction in printing, book-binding, etc., may be opened in the Government Press in Mysore and Bangalore, and they may be under the control of Mr. Yates, Superintendent, Government Press. A grant may be given for the maintenance of these classes.

44. Pupils in all sections should be examined and given a diploma at the end of their course by a Board of Examiners appointed by the Mysore Government. They may also appear for the Madras Government Technical Examinations.

45. The institute should have a workshop equipped with up-to-date appliances. Every endeavour should be made to give training of a high order, special attention being given to developing in the pupils habits of discipline, neatness and accuracy.

The workshop should have two sections one for practice by pupils of the Engineering and Technical sections and the other by those of the Industries and Crafts section.

46. It is an axiom that a student is best trained in a factory and it is therefore necessary to have a workshop managed on commercial lines. The students of the Industries and the Crafts section should not be given a diploma unless they have attended the commercial workshops for a reasonable period. They should put in longer hours of work and get wages for the work actually done.

47. The control of the institute should be vested in a Superintendent.

## Expenditure.

| | Rs. |
|---|---|
| Superintendent ... ... ... ... ... | 500 |
| Four headmasters ... ... ... ... ... | 700 |
| Twelve lecturers ... ... ... ... ... | 1,165 |
| Thirty-four instructors ... ... ... ... ... | 1,335 |
| Menials ... ... ... ... ... | 200 |
| | 3,900 |
| Two hundred and seventy scholarships ranging from Rs. 2 to 10 ... | 1,086 |
| Materials ... ... ... ... ... | 600 |
| Tools ... ... ... ... ... ... | 300 |
| Contingencies... ... ... ... ... ... | 194 |
| | 2,180 |
| Grand Total per mensem ... | 6,080 |
| or per annum ... | 72,960 |

| Deduct— | Rs. | |
|---|---|---|
| Probable receipts from fees and sales ... ... | 18,960 | |
| Net expenditure at present incurred on the Mysore Industrial school ... ... ... | 20,000 | |
| Net expenditure at present incurred on the Engineering school ... ... ... ... | 9,000 | |
| | | 47,960 |
| Net excess expenditure now required per annum ... ... | | 25,000 |

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48. An initial outlay of Rs. 25,000 for the commercial workshop for the purchase of materials and Rs. 25,000 for equipment with machines, etc., will be necessary. The total capital expenditure will be Rs. 50,000.

## VI. Improvement of existing industrial schools in the State.

49. With a view to improving the existing industrial schools in the mofussil, the following proposals are made :—

There are now six Government Industrial Schools in the State. Those at Hassan and Melkote should be taken over by Government and a new one opened at Chitaldrug. There will thus be nine mofussil Government Industrial Schools in the State including the three newly proposed, as detailed below :—

| | *Name of place.* | *Industries to be taught.* |
|---|---|---|
| 1. | Channapatna ... ... | ... Lacquer work, carpentry, musical wire and smithy work. |
| 2. | Chiknayakanhalli ... | ... Weaving, coir work and carpentry. |
| 3. | Chitaldrug ... ... | ... Weaving, carpentry and smithy work. |
| 4. | Dodballapur ... ... | ... Weaving and carpentry. |
| 5. | Hassan ... ... | ... Carpentry, cane work and smithy work. |
| 6. | Hole-Narsipur ... ... | ... Weaving, carpentry and smithy work. |
| 7. | Melkote ... ... | .. Weaving, carpentry and cane work. |
| 8. | Molakalmuru ... ... | ... Weaving and carpentry. |
| 9. | Sagar ... ... | ... Carpentry, rattan work and smithy work. |

50. The subjects of study may be :—

(1) One or more of the industries mentioned above against the schools.
(2) Drawing.
(3) General education : reading, writing, arithmetic, and business methods.

A progressive course of studies may be prescribed by Government. The duration of the course should be one of three years in the case of lacquer work, musical wire making, drawing, weaving and cane work, and of three to five years for carpentry and smithy work.

51. The details of establishment are given in para 54. Industrial schools can never be expected to prosper unless they are properly organised and carefully and intelligently supervised. It is, therefore, suggested that they be placed in charge of fulltime Superintendents. They must be experienced men possessing the power of organization. They must also have a general knowledge of the industries taught in the school in their charge. Such men cannot, under ordinary circumstances, be secured on a lower pay than Rs. 100 a month. It is suggested that such men should start on Rs. 75 per month. All the Superintendents should at first be placed in that grade. Those that have done really good work for at least two years may be promoted to the higher grades. Others that have failed to produce good results in this period should be replaced by passed men from Technical Colleges and by men trained in the College of Technology to be started in Bangalore.

Provision should be made for giving two instructors in some of the industries if the number of students be sufficiently large.

52. Students trained in the school must be able to design and give clear sketches of articles they undertake to make. They must also be able to estimate

accurately the value of the articles they have to prepare. They must know where the various materials required by them can be profitably purchased and where they can sell their manufactured articles to advantage. They must be able to indent in writing for the materials required for their work. It is therefore suggested that instruction in drawing be imparted and that pupils be equipped with a certain amount of general education before they leave the school.

*Scholarships.*

53. Provision may be made for 420 scholarships for all the nine schools to be distributed in accordance with the strength of the schools.

Boys seeking admission into the schools should pay a prescribed fee for a period of at least three months when they may be given the scholarship of class A, if they have been regular in attendance and hard working, and if scholarships are available. *Bona fide* artisans should get scholarships from the date of admission. All boys should bind themselves to attend the school continuously for at least three years.

As boys of these schools have to make a living by the trade they learn, they will not be fit for this unless they work at it for sometime on commercial lines. It is, therefore, suggested that there should be small workshops worked on commercial lines attached to these schools. Boys should be paid wages for work done and they should put in longer hours of work. They should not be given a diploma unless they have had practice for two years in a commercial workshop.

*Details of Expenditure.*

54. The following is a rough estimate of staff, etc., required :—

| | | Rs. | |
|---|---|---|---|
| 9 | Superintendents ... ... ... | 900 | Maximum cost. |
| 41 | Instructors ... ... ... ... | 1,025 | |
| 18 | Teachers and clerks ... ... ... | 405 | |
| | Half-time teachers ... ... ... | 40 | |
| 27 | Menials ... ... ... | 162 | |
| 420 | Scholarships ranging from Re. 1-8-0 to Rs. 5 ... | 1,050 | |
| | Materials for boys ... ... ... | 700 | |
| | Tools ... ... ... ... | 300 | |
| | Contingencies ... ... ... ... | 158 | |
| | Total per mensem ... ... ... | 4,740 | |
| | Do per annum ... ... ... | | 56,880 |
| DEDUCT— | | | |
| | The net cost of the mofussil industrial schools including grants-in-aid to Melkote, Hassan & Hole-Narsipur schools | 17,400 | |
| | Probable income from sales and fees from the reorganized schools ... ... ... | 14,480 | |
| | | | 31,880 |
| | Net additional cost of the nine schools ... ... | | 25,000 |

An initial provision of Rs. 9,000 for equipping all the nine schools with tools, etc., and of Rs. 21,000 for the purchase of materials and payment of wages will be necessary.

## VII. Models of Technical Institutions.

### *A—(1) Technical Schools.*

55. *Object.*—The object is to prepare students for scientific, mechanical, and constructional occupations according to the special requirements of each locality. The students should be given an opportunity of obtaining a knowledge of the use of tools and instruments.

The course hereunder prescribed is intended as a preparatory scientific and practical training for young men intending to follow an industrial career.

56. *Courses of Instruction—*

*General.*

(1) Mathematics.
(2) Elements of physics and chemistry.
(3) Drawing.
(4) Engineering workshop.
(5) Carpentry workshop.

*Special Subjects.*

Training may be given in addition in one or more of the following subjects:—

(1) Mechanical engineering.
(2) Building construction, including earthwork and roads.
(3) Electrical engineering.
(4) Estimating.
(5) Land surveying.
(6) Hydraulic engineering, including management of tanks and canals.
(7) Mining.
(8) Metalware work.

57. *Staff and Equipment—*

(Note.—The staff suggested will probably suffice to give instruction in two or three special subjects.)

*Establishment.*

| | | Rs. |
|---|---|---|
| Headmaster ... ... ... ... | | 250 |
| Drawing master ... ... ... ... | | 75 |
| Two assistant masters at Rs. 75 each ... ... ... | | 150 |
| Three special assistants at Rs. 50 each ... ... ... | | 150 |
| Workshop Superintendent ... ... ... | | 100 |
| Foreman, superintendent or maistri ... ... ... | | 50 |
| Office establishment ... ... ... ... | | 75 |
| | Total ... | 850 |
| | Per year ... | 10,200 |
| Workshop expenses ... ... ... ... | | 700 |
| Repairs to machinery and buildings ... ... ... | | 1,000 |
| | Total ... | 11,900 |
| | or, say, ... | 12,000 |

If a new building cannot be provided at the outset, a beginning may be made by hiring one. An engineering and a carpentry workshop may be provided at a cost of about Rs. 10,000.

58. *Cost.*—The initial capital cost will vary from Rs. 25,000 to Rs. 50,000 and the yearly expenditure will be about Rs. 12,000.

In cases where economy is important, the cost may be reduced by a proportionate reduction of the subjects and staff. The minimum amount required for this class of institutions may be put down at Rs. 6,000 per annum.

59. Industrial schools will be in greater demand than technical institutions for some time to come, the difference between the two being that in the latter there will be more theory and in the former more practice. Boys trained in industrial schools will probably find employment more readily than those educated in technical schools. The latter class of institutions will give a training of more scientific, and therefore more permanent, value.

### (2) *Art Trade Schools.*

60. *Object.*—The object of an art trade school is to give instruction in the application of art to industry and in the observance of the principles of grace and harmony in nature to the preparation of objects of trade and daily use. The articles manufactured must, it is true, be durable and serviceable. But, in art trades, the worker should particularly bear in mind grace of form and harmony of colour and not be merely a mechanical producer of useful wares.

61. *Subjects to be taught.*—A selection may be made for giving instruction in one or more of the following subjects:—

(1) Wood-carving, including sandalwood carving and inlaid work.
(2) Furniture design and cabinet-making.
(3) Decorative painting, including interior decoration.
(4) Sculpture, including stone-carving.
(5) Photography.
(6) Graphic art.
(7) Gold and silver smithy.
(8) Etching, engraving and lithography.
(9) Lace-making and embroidery.

Where a complete school cannot be established, one or more of the arts can be taught by opening special classes in an existing industrial school or a school of general education.

62. *Cost.*—The capital cost of an art trade school may be roughly estimated at Rs. 25,000, including buildings and equipment. The recurring expenditure may amount to Rs. 6,000 including materials. The cost will, however, depend on the number of pupils and of subjects selected.

63. The course of instruction for each trade should ordinarily be one of three years, of which the first should be a preparatory course. In some special subjects, such as gold and silver smithy, students will require longer practice. Such practice may be afforded by extending the course by one or more years as required.

64. *Preparatory course.*—The subjects taught in the preparatory course should be:—

(1) The elements of geometry.
(2) Arithmetic.
(3) English and Kanarese composition.
(4) Use of scales, squares and drawing instruments.
(5) Geometrical drawing and geometrical ornamentation.
(6) Free hand and model drawing.

For those who have aptitude, the elements of algebra, physics and book-keeping may also be taught.

During the closing period of the training, particular attention should be given to preparation of designs and detailed estimates of cost.

65. The standard of admission may be general education corresponding to the Lower Secondary or other equivalent examination. But there should be no rigid restrictions in this respect. Students trained in trade or craft schools or sons of artizans may also be admitted into art trade schools.

*(3) Industrial Schools.*

66. These schools are intended to train boys in particular industries that they may, after leaving the school, follow the industry taught and earn a living by it. The work should be mostly practical and very little of theory should be taught.

67. The subjects of study may be as under :—

I. One of the following trades :—

1. Carving.
2. Cabinet-making.
3. Carpentry.
4. Carriage building.
5. Painter's work.
6. Lacquer work.
7. Smithy work.
8. Fitter's work.
9. Musical wire making.
10. Tinsmith's work.
11. Metal work (hammered and cast).
12. Cane and basket work.
13. Weaving.
14. Dyeing.
15. Tailoring.
16. Boot and shoe-making.
17. Book-binding.
18. Brick work and masonry.
19. Land surveying.
20. Rope-making.
21. Mat-weaving.

II. Drawing.

III. General education—Reading, writing and arithmetic.

IV. Business methods.

V. Modelling.

The course of instruction should be one of 3 to 5 years according to the nature of the industry taken up.

68. The staff may consist of a superintendent, a foreman for each of the industries taught in the school, a drawing master, and office establishment to the extent needed (including teachers for general education).

Each school may take up 2 or 3 industries according to the requirements of the locality and may cost roughly Rs. 5,000 a year (staff, material tools, etc., included).

69. A school which trains and sends out boys that they may make a living by working at a trade, cannot successfully do so unless it has a workshop working on commercial lines attached thereto. The initial cost of equipping such a workshop with tools, etc., will vary according to the requirements of the industries selected. It may be roughly estimated as ranging from Rs. 1,000 to Rs. 6,000. A fixed provision of about Rs. 2,000 will be required for materials, etc., for the commercial workshop.

70. These industrial schools will prosper only if the people of the locality take an active interest in them. It seems important that new schools should be started only in places where people come forward with contributions towards the upkeep of such institutions.

*Craft Schools or Lower Industrial Schools.*

71. These schools are for imparting to the sons of raiyats instruction in rural crafts or industries so as to enable them to make and repair their own agricultural tools, implements and other requisites.

72. Instruction may be imparted in one or more of the following special subjects according to the requirements of each locality :—

(i) 1. Rural carpentry (such as making country carts, agricultural implements, such as ploughs, doors, windows, etc.)
2. Smithy.
3. Basket work.
4. Rope-making.
5. Kambli-weaving.
6. Weaving (cloths of lower counts).
7. Sericulture and silk-reeling.
8. Mat-weaving.

(ii) Elementary drawing.

(iii) General education in the vernacular.

73. The course should be one of one to three years. A small business workshop may be attached to each school, where the pupils should be required to work for a further period of one to two years receiving wages for work done. This should complete the training.

74. The school will cost about Rs. 250 to 600 per annum, according to the number of subjects taught. The cost of equipping such a school with tools, etc. will be Rs. 100 to 300. An initial allotment of Rs. 200 for purchase of materials, etc., will also be necessary.

75. In places where separate schools cannot be established, it should be sufficient, if special classes in local schools are arranged for. The annual cost would then be much less.

*(4) Commercial Schools.*

76. A proper business education for all classes of people in Mysore is an urgent necessity. In many walks of life the people are following old time practices which hinder progress. If, however, business principles are applied to daily avocations, unintelligent and wasteful labour will be lessened. The importance of co-operative effort and mutual helpfulness should be recognized. The production, distribution and uses of merchandise should be better understood. The means of utilizing Government help and the benefits of organization should be brought home to all classes of people.

77. Higher commercial education will be necessary as a preparation for business life to young men inheriting large agricultural and industrial properties and also for Government officers and managers of all large concerns.

The basis of higher commercial education must be economic science, commercial history, commercial law and commercial geography. The education must enable the student in after-life to handle great affairs in a merchant's or manufacturer's office and he should be able to trace and analyse the profit and loss in every department of a large business.

78. Provision is made in the curriculum of studies for the College of Technology for instruction in Higher Commerce. A separate institution is not necessary for this purpose.

*Secondary Commercial Education.*

79. This should include:—

(1) Commercial correspondence, penmanship, handwriting, and type-writing.
(2) Phonography or phonetic short hand.
(3) Business practice and methods.
(4) Book-keeping.
(5) Estimates of cost.
(6) Commercial arithmetic and geography and commercial law.
(7) Office practice and knowledge of wares.
(8) Commercial morality.

80. Lower commercial education should include a training for the formation of character in the modern sense. The habits of punctuality, diligence and discipline should be specially inculcated. The student should be taught to cultivate a sense of honour and to understand his duties and relations to his fellowmen and the State.

The subjects taught should be the three R's, book-keeping, both Indian and European, correspondence and a knowledge of the resources of the country. Instruction should be given in the elements of commercial morality.

*Cost.*

81. Where a complete commercial school is not started, only a few selected subjects from the list given above should be taken up.

We have provided for commercial classes both in the College of Technology and in the proposed technical institute in Mysore. A special school of the elementary standard will cost probably Rs. 1,200 per annum and that of a secondary standard Rs. 3,600. But as business training is essential even along with general education classes, the teaching of commercial subjects should be provided in every town, and, where separate classes are not feasible, at least continuation schools or lectures should be arranged for.

82. We attach great importance to the value of a course in economic science, statistics and public administration for every officer of the Revenue Department.

(5) *Girls' Industrial Schools.*

83. Industrial education for girls is a matter of slow growth in a country where only one woman in 144 can read or write and where religious and social restrictions are so many and so rigorous.

84. The girls' institutions may be considered under three heads:—

(1) Elementary domestic subjects schools.
(2) Secondary domestic subjects schools.
(3) Industrial and craft schools.

85. The general education needed by girls in this country is a course calculated to foster in them habits of diligence, order, thrift, cleanliness, neatness and accuracy.

Every girl should be taught sewing as is done in Japan.

To all classes of girls, household economy should be taught, to girls of the higher classes lessons in ordering, adjusting and managing a house, and to those of the lower classes, elementary lessons in house work, housekeeping, sewing and cooking.

86. Courses of study—

(1) *Elementary Domestic Subjects Schools.*

Domestic economy (elementary lessons in house work and housekeeping).
Sewing.
Cooking
Laundrying

(2) *Secondary Domestic Subjects Schools.*

Reading, writing and arithmetic. Instruction in household economics (housework and management of the house).
Hygiene.
Home medicines, nursing and midwifery.

*Special Subjects.*

Music.
Freehand drawing.

(3) *Industrial Schools for Girls.*

The curricula will have to be specially prepared where a high class industrial school is needed. Such a school will sooner or later be necessary in places like Bangalore and Mysore.

The girls should have gone through one or the other of the domestic subjects schools before preparing themselves for any special industry or art trade.

The main object should be to teach the girls of the poorer classes some sort of industry so as to enable them to gain their livelihood after they have finished their scholastic career.

The trades in which instruction may be given are—

Embroidery.
Lace-making.
Knitting.
Millinery.
Photography.
Upholstery.
Dairying.
Bread-making.
Making preserves.

Along with each subject, instruction should be given in drawing, designing and estimating.

87. Each class of school may be started with at least two teachers at the commencement. The elementary school may cost about Rs. 600 per annum, the secondary school Rs. 1,500 per annum, and a girls' industrial school about Rs. 3,000. The expenditure will increase with the number of subjects and of pupils requiring instruction.

Cost and staff.

88. In villages, the girls may be given instruction in cooking, house management, field work, care of domestic animals and also in special trades like mat-making, basket work, rope-making, bamboo and cane work.

Wherever a regular domestic subjects school for girls cannot be established for want of funds, classes for teaching special subjects may be attached to an existing girls' school. In the last resort, morning classes or lectures may be arranged for.

*B. Special Classes, Continuation Schools or Classes and Lectures.*

89. A detailed description of each of the suggested types of smaller technical and industrial schools having been given, it is proposed in this section to suggest other forms of provision for technical education suited to places which, from poverty of resources or want of facilities, are unable to adopt one of the suggested types in all its completeness. The alternatives suggested are (*a*) Special classes, (*b*) Continuation schools or classes, and (*c*) Lectures.

(*a*) *Special Classes.*

90. Where suitable accommodation is available either in the local school or in close proximity to it, special classes for instruction in any of the courses suggested for model schools may be held during the usual working hours of a school. These classes may be in charge of a teacher specially appointed for the purpose but under the general management of the headmaster of the local school. The cost of maintaining a single class of 30 pupils may vary from Rs. 150 to Rs. 400 a year according to the course selected and the qualifications of the teacher.

(*b*) *Continuation Schools or Classes.*

91. Where separate accommodation is not available for special classes, morning or evening classes for instruction in selected subjects may be held in existing school buildings. These classes may be conducted by local teachers who have obtained technical training or until trained teachers become available by skilled artisans under the guidance of a teacher of the local school. The class may be held for two hours twice or thrice a week. The minimum remuneration for each day's work may be 8 annas in the case of a teacher of an elementary or middle school and Re. 1 in the case of a high school teacher. These classes should be open not only to regular students but also, as far as possible, to all others who wish to attend them.

(*c*) *Lectures.*

92. Organised courses of lectures on subjects suggested for model schools may be delivered in selected places by competent local teachers or itinerant lecturers specially appointed for the purpose. The aim of instruction should be to give the pupils information on points likely to be of great practical value to them and by a description of the material, tools, etc., employed in the industry to stimulate interest in their calling.

The salary of a whole-time lecturer, when one is appointed for the purpose, may according to his qualifications be from Rs. 50 to Rs. 100. In the case of

competent local teachers undertaking the work, the minimum monthly allowance should be Rs. 20.

## VIII. Scholarships and Foreign Training.

### *Scholarships given in India outside the State.*

93. The scholarships offered by Government to Mysore students wishing to prosecute their studies in specified subjects in Colleges outside the State, are the following:—

Ten scholarships of the value of Rs. 15 to 20 each, tenable for three years in one of the technical or commercial Colleges, or Schools of Arts in Bombay, Madras or Calcutta.

Three of the value of Rs. 30 a month, tenable for three years in an Engineering College.

Two of Rs. 25 each, tenable for four or five years in the Madras or Bombay Medical College.

Two of Rs. 10 to 15, tenable for three years in a College of Agriculture.

The maximum yearly grant required for these scholarships is Rs. 13,790. The actual budget allotment for the year 1911-12 was Rs. 14,559.

94. There were during the past year 17 students holding medical scholarships in Bombay or Madras, 10 holding engineering scholarships in the Engineering College at Madras, 2 holding agricultural scholarships in Coimbatore, 29 holding technical scholarships in Bombay, Madras or Calcutta and 2 holding scholarships in the Teachers' College, Madras. The actual amount paid to these students per month amounted to Rs. 1,340 or per annum to Rs. 16,080, of which a sum of Rs. 9,420 was to be met from State Funds and Rs. 6,660 from Local Funds General.

95. Besides these professional and technical scholarships, scholarships for general education were awarded to 6 students studying in the Mahomedan Anglo-Oriental College at Aligarh, and to 4 students studying for the B. A. Honours Course in Madras. The total amount spent on these scholarships was Rs. 3,000.

Thus the scholarships held by students prosecuting their studies in Indian Colleges outside the State during the year 1911-12 amounted to Rs. 19,080.

The provision seems to be adequate and the scholarships are fairly well distributed.

### *Scholarships held in Foreign Countries.*

#### *State Fund Scholarships.*

96. Until now only two scholarships appear to have been granted from State Funds, one for Law, and the other for Medicine.

#### *Damodar Dass Charities Fund Scholarships.*

97. Rules for the grant of scholarships for scientific research and technical education from the Damodar Dass Charities Fund were first issued in May 1906. Ordinarily two scholarships of £200 each are granted every year, and each scholarship is tenable for two years or such other period as may be fixed by the Mysore Government, having regard to the subject selected for study or research. The scholarships are granted to students selecting one or more of the following subjects:—

I. Chemistry.
II. Physics.
III. Application of chemistry or physics to agriculture or the various arts and industries.
IV. Medical research, in any branch including hygiene and bacteriology.
V. Mechanical engineering.
VI. Mining and metallurgy, including electro-metallurgy.
VII. Electrical engineering.

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In special cases these scholarships are granted also for the encouragement of higher studies in Sciences other than those specified above.

The following table shows the subjects for which these scholarships were held during the past year :—

| Subject | Place of study | Number of scholarships | Amount |
|---|---|---|---|
| | | | Rs. |
| Medicine ... ... ... | England ... | 2 | 6,000 |
| Science ... ... ... | Do ... | 1 | 3,750 |
| Electrical standardising ... ... | Do ... | 1 | 3,000 |
| Electrical engineering ... ... ... | America ... | 1 | 3,000 |
| Engineering with special reference to architecture. | London ... | 1 | 3,000 |
| Forestry ... ... ... | Oxford ... | 1 | 4,500 |
| Agriculture ... ... ... | England ... | 1 | 3,645 |
| Agricultural chemistry ... ... | Germany ... | 1 | 3,000 |
| Law (paid from State Funds) ... ... | ..... | 1 | 3,750 |
| | | | 33,645 |
| Omitting scholarships given for medicine, science, forestry and law ... ... | | | 18,000 |
| Scholarships for purely technical subjects ... ... ... ... | | | 15,645 |

*Additional Scholarships proposed by the Committee.*

98. The Committee feel that the necessity for making adequate provision for the training of young men sent to Europe in industrial subjects has not received sufficient attention, and they, therefore, feel it necessary to urge that during the next few years two scholarships of £300 each be granted annually from the State Funds, to students offering to study any one of the following subjects :—

1. Chemical industries.
2. Textile industry (including dyeing and bleaching).
3. Tanning and the manufacture of leather goods.
4. Iron and steel work.
5. Wrought metal industry.
6. Machine construction.
7. Electrical industries.
8. Ceramics and glass manufacture.
9. Manufacture of candles, greases and industrial oils.
10. Paper and cardboard manufacture.

It is to be understood that the selected students are expected to study principally the practical and commercial details and information that may be of service to them in starting the industry in which they have qualified themselves on their return to the State. The students selected should undergo a preliminary training in an Indian institution before leaving for Europe or other countries.

*Travelling Professors or Commissioners.*

99. The Committee attach great importance to the necessity of the State being in touch with the latest developments in arts and industries in other parts of the world, and with this view they recommend that two local officers should be constantly placed on deputation in foreign countries each for a period of not less than six months at a time. This arrangement would cost the State annually about Rs. 30,000 for salaries, passage money, and allowances.

100. If the proposals of the Committee are accepted, the annual expenditure on account of technical scholarships and foreign training would stand thus :—

| Subjects | Period | No. | Monthly rate | Maximum yearly amount |
|---|---|---|---|---|
| *Scholarships paid in India—* | Years | | Rs. | Rs. |
| Technical ... ... ... | 3 | 10 | 15 or 20 | 7,200 |
| Engineering (when necessary) ... | 3 | 3 | 30 | 3,240 |
| *Damodar Dass Charity Fund Scholarships—* | | | | |
| Subjects specified in the rules ... | 2 or 3 | 2 | 250 | 18,000 |
| *Additional Scholarships proposed by the Committee--* | | | | |
| Industrial subjects ... ... | 3 | 2 | 375 | 27,000 |
| *Travelling professors or Commissioners—* | | | | |
| Arts and Industries ... ... | Not less than 6 months. | 2 | ... | 30,000 |
| Grand Total ... | ... | ... | ... | 85,440 |

The estimated expenditure on scholarships in India and on technical scholarships in foreign countries will amount to Rs. 10,440 and Rs. 18,000, respectively, and these sums may be met from the present grants from the funds concerned.

The extra expenditure required for the additional technical scholarships and for the travelling commissioners proposed will together amount to Rs. 57,000, for which provision has been made in the new scheme (*vide* Appendix III).

## IX. Proposals for gradual development.

101. Our scheme in effect provides for starting one large institution in Bangalore, one in Mysore and also for improvement in the equipment and teaching of the existing industrial schools in the State.

Beyond this, it merely makes provision for an annual lump sum grant of Rs. 93,000 to be given as subsidies and grants-in-aid to those willing to start similar institutions in other parts of the State or for establishing model Government Schools.

102. We have given some particulars of model institutions to enable a selection to be easily made. We attach special importance to the adoption of measures whereby every town or village requiring education in any particular subject shall have an opportunity of making a start with the minimum of outlay necessary for such a purpose.

103. The total additional expenditure proposed for buildings, equipment, etc., is Rs. 5 lakhs in the first three years and the annual expenditure proposed is Rs. 3 lakhs. This is exclusive of the amount already spent on industrial education in the State, as explained above. After three years both the capital and recurring outlay will have to be increased if it is found that satisfactory progress is made in the meanwhile.

104. The entire scheme as explained already should be treated as tentative. No permanent pensionable appointments need be made until Government are satisfied with the successful working of the new movement in the earlier stages.

## X. Administrative control and estimate of cost.

105. At present the control of industrial education in the State is vested in the Inspector-General of Education. In future, a special officer will have to be appointed for the purpose on a salary of about Rs. 1,000. He will work either as an Assistant to the Inspector-General of Education or the Director of Industries if one is appointed, or if Government see fit, he may be treated as the head of an independent department. No officer should be in charge of the department for more than three years at a time unless he has special aptitude for the work as evidenced by the results achieved.

106. There should be at least one Inspector for the supervision of schools and for helping local authorities in starting new schools. This officer should also be liable to be changed once in two or three years unless re-appointed.

107. The approximate cost of direction will be as under :—

| *Direction Charges.* | *Per annum.* |
|---|---|
| | Rs. |
| (1) Director at Rs. 1,000 per month ... ... ... | 12,000 |
| (2) Inspector at Rs. 300—500 ... ... ... ... | 4,800 |
| (3) Office establishment at Rs. 400 per mensen ... ... | 4,800 |
| (4) Travelling allowances and all miscellaneous expenditure ... | 3,000 |
| Total... | 24,600 |
| or, say, | 25,000 |

108. Every technical institution should have a Committee of management with which the leading private gentlemen engaged in trade, industry or education should be associated. This is the principle on which all technical schools are managed in European countries. The head of the school and the local officers of the education and technical Departments of Government should also form members of the Committee.

Total cost.

109. An abstract estimate of cost of the proposed developments is given in Appendix III. The main heads of expenditure are as under :—

| | Rs. |
|---|---|
| (1) College of Technology in Bangalore ... ... ... | 75,000 |
| (2) Chamarajendra Technical Institute in Mysore ... ... (Additional expenditure only.) | 25,000 |
| (3) Improving existing industrial Schools ... ... ... (Additional expenditure.) | 25,000 |
| (4) Subsidies or grants-in-aid to help local bodies or associations to start technical institutions including the establishment of Government model institutions ... ... ... ... | 93,000 |
| (5) Scholarships and foreign training ... ... ... (Additional expenditure.) | 57,000 |
| (6) Direction and control ... ... . . ... | 25,000 |
| Total ... | 3,00,000 |

The capital outlay (*vide* Appendix III) will be Rs. 5 lakhs to be expended in the first three years. The Committee consider that time should not be lost in starting the institutions required till new buildings are constructed for them. Work may be allowed to be begun in hired premises to enable the people to make an early start.

## XI. Conclusion : summary of recommendations.

110. There are commercial and technical colleges on the Continent of Europe which are maintained mainly from private contributions and from fees paid by students. In many of the individual States in North America, technical education is given free. In Mysore, we have to provide for the requirements of the State within the limits of its resources and encourage private effort and contributions as far as possible. Expensive arrangements, whether for buildings or for professors, at this stage, should be severely discouraged if the institutions are not to prove a burden and get into disfavour both with the authorities and with the public.

111. No apology is needed for suggesting a scheme of technical education as indicated in this report. Education on these lines is, in our opinion, overdue in this country.

So long ago as 1888, His Excellency the Viceroy in Council emphasised "the need for scientific methods to develop the material resources of India * * * so that Indians may better hold their place in the markets of the world where competition is carried on with an intensity of purpose which has been compared to the conditions of warfare."

In a Council speech in 1906, the late Viceroy, Lord Minto, said "Technical instruction in other countries is growing apace * * * The success of modern industries and the preservation of indigenous industries is every day becoming more and more dependent on scientific and technical knowledge and if the resources of India are to be developed, such development must depend largely upon local enterprise and upon recognition of the absolute necessity of expert training." Mr. Montagu, the Under-Secretary of State for India, spoke in the same strain in introducing the Indian Budget in Parliament last year.

112. Foreign countries are spending colossal sums on technical education. One High School in Berlin, the Charlottenburg Technical High School, is maintained at an annual outlay of Rs. 10½ lakhs. The more recently started Manchester Institute in England costs Rs. 6 lakhs per annum. They spent Rs. 75 lakhs in order to bring the former institution into existence and Rs. 45 lakhs on the latter. Japan has also started large institutions and is besides maintaining students in all the leading Technical Universities of Europe and America.

No one can question the necessity or importance of the proposals we have put forward. The expenditure we have recommended, small though it is, will enable Government to make a modest beginning.

113. Our recommendations may be summarized as follows:—

(1) That Government do incur a capital expenditure of at least Rs. 5 lakhs for buildings and equipment, and an additional recurring expenditure of 3 lakhs per annum for developing industrial and technical institutions in the State.

(2) That a Director with a capacity for organising such institutions be appointed on such salary as he may be had for.

(3) That the scheme of technical education as laid down above be introduced and developed under the advice of the Committees for Education and for Industries and Commerce of the Mysore Economic Conference.

(4) That arrangements be made for starting at once one or two classes to form the nucleus of a future College of Technology in Bangalore, work being begun in hired premises till proper buildings and equipment are provided. Facilities for workshop and laboratory practice should be arranged for.

(5) That arrangements be made for starting the Chamarajendra Technical Institute in Mysore from the commencement of 1913-14.

(6) That every town and important village, desirous of starting any of the technical institutions, as per models given above, be assisted by the Director in starting and maintaining such institutions on receipt of an application from the District Boards, Municipalities or Associations or Guilds of private citizens through the head of the district.

(7) That, since any permanent development of industrial education in the districts will depend on the extent to which voluntary effort on the part of the people is enlisted, every application for an institution or class should be accompanied by an offer to meet one-half or other percentage of the entire cost of such institution or class, as Government may fix in each case. A few model institutions of the same class may be started entirely at Government expense.

(8) That the entire scheme be tentative for a period of three years, which may be extended to five. The scheme may be revised and reconsidered at the end of five years.

(9) That scholarships be given to help the Mysore students to prosecute their studies in technical and commercial subjects in England and other foreign countries or Indian Colleges outside Mysore to the extent recommended.

(10) That two officers be constantly placed on deputation in Europe, America and Japan to keep touch not only with the most modern systems of industrial and technical education but also with progress in industries and commerce.

BANGALORE,
*10th September 1912.*

M. VISVESVARAYA.
V. RANGASWAMY IYENGAR.
C. KRISHNA RAU.
G. SUBBASWAMY IYER.

## APPENDIX I.

*Proceedings of the Government of His Highness the Maharaja of Mysore, Local Fund and Sanitary (Education), dated 28th October 1910, appointing the Committee.*

No. 3585-9—Edn. 462-09-2, dated Bangalore, 28th October 1910.

Order.—The Government consider that the subject of improving the Industrial Schools in the State should engage early attention and that it is essential that a definite policy and plan of work should be adopted so as to secure the best possible results in this important branch of education. They are accordingly pleased to appoint a Committee consisting of the undermentioned gentlemen for considering the subject and submitting their proposals:—

(1) Mr. M. Visvesvaraya, Chief Engineer (President).

(2) ,, J. Weir, Inspector-General of Education in Mysore.

(3) ,, V. Rangaswamiengar, Executive Engineer.

(4) ,, C. Krishna Rao, Headmaster, Government High School, Bangalore.

(5) ,, G. Subbaswami Iyer, Superintendent, Industrial School, Mysore.

2. The Committee is requested to go into a consideration of the subject in all its aspects and submit a full and detailed report, within six months, indicating among other things, how the Industrial Schools should be conducted according to a comprehensive programme and what defined courses of training should be systematically followed.

3. The Inepector-General of Education will furnish the Committee with all information that may be required about the working of the existing Industrial Schools and other necessary particulars connected with them.

## APPENDIX II.

Statement showing particulars of Government and Aided Industrial Schools in the Mysore State for the year 1910-11.

| Names of schools | Subjects taught | Number on rolls on 30th June 1911 | Machinery and tools | Cost of establishment | Scholarships | Contingencies | Total | Remarks |
|---|---|---|---|---|---|---|---|---|
| *Government Schools—* | | | Rs. a. p. | Rs. a. p. | Rs. a. p. | Rs. a. p. | Rs. a. p. | |
| Industrial School, Mysore ... | (1) Cabinet-making, (2) Carpentry, (3) Smithy, (4) Fitter's, (5) Cane and basket work, (6) Tile-making, (7) Pottery, (8) Free hand outline drawing, (9) Geometrical drawing, (10) Painting, (11) Design, modelling and (12) General Education ... ... ... | 208 | 1,505 0 3 | 11,774 2 7 | 7,371 2 1 | 226 14 2 | 20,877 3 1 | |
| Weaving School, Dodballapur ... | (1) Weaving and (2) Carpentry ... ... ... | 51 | 100 0 0 | 1,252 12 5 | 642 0 0 | 180 0 0 | 2,174 12 5 | |
| Do Chiknayakanhalli | Do ... ... ... | 24 | 100 0 0 | 1,053 11 10 | 600 0 0 | 204 0 0 | 1,957 11 10 | |
| Do Molakalmuru ... | Do and (3) Drawing... ... | 21 | 100 0 0 | 1,300 0 0 | 594 0 0 | 207 0 0 | 2,201 0 0 | |
| Industrial School, Channapatna ... | (1) Lacquer work, (2) Musical wire-making, (3) Nature imitation art, (4) Smithy, (5) Carpentry and general education ... ... ... ... | 63 | 100 0 0 | 1,465 0 0 | 480 0 0 | 177 0 0 | 2,222 0 0 | |
| Do Sugar ... | (1) Carpentry and (2) Smithy ... ... ... | 13 | 100 0 0 | 1,008 0 0 | 360 0 0 | 99 0 0 | 1,567 0 0 | |
| Do Hole-Narsipur ... | Carpentry ... ... ... ... ... | 35 | 100 0 0 | 742 0 0 | 300 0 0 | 120 0 0 | 1,262 0 0 | |
| | Total ... | 415 | 2,105 0 3 | 18,595 10 10 | 10,347 2 1 | 1,213 14 2 | 32,261 11 4 | |

| Names of schools | Subjects taught | Number on rolls on 30th June 1911 | Amount paid from Government | Total | Remarks |
|---|---|---|---|---|---|
| *Aided Schools—* | | | Rs. a. p. | Rs. a. p. | |
| Mission Industrial School, Tumkur ... ... | (1) Carpentry, (2) Smithy and (3) Rattan work ... ... ... ... | 61 | 2,186 0 0 | 2,186 0 0 | |
| Do Kolar ... ... | (1) Carpentry, (2) Smithy, (3) Masonry, (4) Fitting and (5) Agriculture ... | 118 | 1,200 0 0 | 1,200 0 0 | |
| St. Joseph's School, Mysore ... ... ... | (1) Carpentry, (2) Drawing, (3) Gardening and (4) Music ... ... ... | 8 | 240 0 0 | 240 0 0 | |
| Weaving Institute, Hole-Narsipur ... ... | (1) Weaving and (2) Dyeing ... ... ... ... ... | 43 | 1,020 0 0 | 1,020 0 0 | |
| Industrial School Hassan ... ... ... | Carpentry ... ... ... ... ... ... ... | 25 | 1,200 0 0 | 1,200 0 0 | |
| Do Melkote ... ... ... | (1) Carpentry, (2) Rattan work, (3) Weaving and (4) Tailoring ... ... | 69 | 1,200 0 0 | 1,200 0 0 | |
| Do Bagepalli ... ... ... | (1) Carpentry and (2) Tin work ... ... ... ... | 20 | 151 15 0 | 151 15 0 | |
| Do Goribidnur ... ... ... | Carpentry ... ... ... ... ... ... ... | 31 | 156 0 0 | 156 0 0 | |
| Do Srinivaspur ... ... ... | (1) Carpentry and (2) Mat making ... ... ... ... | 22 | 156 0 0 | 156 0 0 | |
| Doddanna's Industrial School, Bangalore ... ... | (1) Rattan work, (2) Drawing (3) Clay modelling ... ... ... | 253 | 1,200 0 0 | 1,200 0 0 | |
| | Total ... | 650 | 8,709 15 0 | 8,709 15 0 | |

## APPENDIX III.

Abstract Estimate of Cost of Proposed Developments.

| List of institutions | Capital cost | Annual recurring expenditure |
|---|---|---|
| | Rs. | Rs. |
| 1. College of Technology in Bangalore ... | 3,00,000 | 75,000 |
| 2. Chamarajendra Technical Institute in Mysore (additional expenditure, *vide* para 48 of report) | 50,000 | 25,000 |
| 3. Improvement of existing Industrial Schools (additional expenditure, *vide* para 54 of report)... | 30,000 | 25,000 |
| 4. Subsidies and Grants-in-aid of— | | |
| (1) Technical schools, classes or lectures ... | | |
| (2) Art trade do ... | | |
| (3) Industrial and craft schools, continuation classes or lectures. | 1,00,000 | 93,000 |
| (4) Commercial classes or lectures ... | | |
| (5) Girls' do | | |
| and the establishment of Government model institutions of the same class where needed. | | |
| 5. Scholarships and foreign training (additional expenditure, *vide* para 100 of report) ... | ..... | 57,000 |
| 6. Direction and control ... ... ... | ..... | 25,000 |
| Total ... | 4,80,000 or, say, 5,00,000 | 3,00,000 |